22. The method of claim 21 wherein, each reaction comprises at least four nucleoside triphosphates chosen from the group consisting of ATP, CTP, GTP, and UTP or rTTP, and further comprises one ddNTP.

23. The method of claim 21 wherein, each reaction comprises at least four nucleoside triphosphates chosen from the group consisting of dATP, dCTP, dGTP, dUTP, dTTP, 7-deaza-dGTP, dITP, 5-methyl-dCTP, 5-hydroxymethyl-dCTP and further comprises one ddNTP.

24. The method of claim 21 wherein, each reaction comprises at least four nucleoside triphosphates chosen from the group consisting of 2'-F-ATP, 2'-F-CTP, 2'-F-GTP, 2'-F-UTP, 2'-F-TTP, 7-deaza-2'-F-GTP, 2'-F-ITP, and 5-methyl-2'-F-CTP, 5-hydroxymethyl-2'-F-CTP and further comprises one ddNTP.

25. The method of claim 1, wherein a dinucleotide or trinucleotide for initiation of *de novo* nucleic acid synthesis is added to the reaction mixture.

26. The method of claim 17, wherein at least one of the nucleoside triphosphates in the reaction mixture is modified to contain a radioactive or non-radioactive label.

27. The method of claim 17, wherein the ddNTP in the reaction mixture is modified to contain a radioactive or non-radioactive label.

c) evaluating the reaction products so that the sequence of the template molecule may be deduced.

31. The method of claim 30 wherein the nucleic acid synthesis is part of or coupled to a method for nucleic acid amplification.

32. A kit for performing the method of claim 30 comprising a mutant nucleic acid polymerase which has reduced discrimination between canonical and non-canonical nucleoside triphosphates and data or instructions describing conditions under which the method of claim 30 may be performed.

33. A kit for performing the method of claim 31 comprising a mutant nucleic acid polymerase which has reduced discrimination between canonical and non-canonical nucleoside triphosphates and data or instructions describing conditions under which the method of claim 31 may be performed.

34. A method for determining the sequence of a nucleic acid molecule using a mutant RNA polymerase which has a reduced discrimination for non-canonical versus canonical nucleotides as substrates, comprising the steps of:

a) synthesizing a nucleic acid molecule by extending a primer, at least part of which is sufficiently complementary to a template molecule so as to anneal therewith, in a reaction mixture containing a mutant RNA polymerase in each of four separate

reactions, each reaction comprising at least four nucleoside triphosphates, wherein at least one nucleoside triphosphate has a nucleic acid base which is complementary to each of adenine, cytidine, guanine and uracil or thymine and a sugar with either a hydrogen or a fluorine at the 2'-position, and a portion of a rNTP, such that each of the four separate reactions contains a rNTP that is complementary to a different one of the four common nucleic acid bases in a nucleic acid molecule,

b) treating the nucleic acid products of the reactions so as to bring about hydrolysis of the phosphodiester backbone at all sites where a ribonucleotide has been incorporated, and

c) evaluating the reaction products using any of the methods common in the art for separating and detecting reaction products of sequencing reactions so that the sequence of the template molecule may be deduced.

35. The method of claim 34 wherein the nucleic acid synthesis is part of or coupled to a method for nucleic acid amplification.

36. A kit for performing the method of claim 34 comprising a mutant nucleic acid polymerase which has reduced discrimination between canonical and non-canonical nucleoside triphosphates and data or instructions describing conditions under which the method of claim 34 may be performed.